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ABSTRACT

Several contextual factors were investigated related to the information needs of educational administrators. In a survey of 119 administrators, the following issues were studied: (1) varying preferences for different information sources; (2) the effects on preferences for information sources of different decision or program development tasks; (3) demands for accountability; and (4) program uncertainties. Major findings were that administrators generally found information from verbal sources (conversations with staff) more useful for program development than information from analytic sources (structured evaluations). Analytic information was most useful for administrators when demands for accountability and program certainty were at high levels. Future research should focus on evaluation methods that link the compensatory strengths of verbal and analytic sources of information. (Author/DWH)

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Clarifying Information Needs for Program Evaluation

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Abstract

Several factors were investigated related to the information needs of educational administrators. In a statewide survey of 119 administrators the following issues were studied: (1) varying preferences for different information sources; and the effects on preferences for information sources of (2) different decision or program development tasks, (3) demands for accountability and (4) program uncertainties. Major findings were that administrators generally found information from verbal sources (e.g., conversations with staff) more useful for program development than information from analytic sources (e.g., structured evaluations). Analytic information was most useful for administrators when demands for accountability and program certainty were at high levels. Future research should focus on evaluation methods that link the the compensatory strengths of verbal and analytic sources of information.

Clarifying Information Needs for Program Evaluation[1]

Improving the utilization of information has become a centerpiece of many different approaches to evaluation design (Bryk, 1983; Cronbach, 1980; Guba & Lincoln, 1981; Patton, 1978). Though it is obvious that evaluation findings should be closely linked to policy development, program management and service delivery, understanding how to create this connection remains a formidable challenge (Beyer & Trice, 1982). The problem appears to center around the discrepancies between the content and form of information provided by evaluation activities and the information needs of decision makers and other program constituencies (Alkin, Daillak, & White, 1979; Cox, 1977; Leviton & Hughes, 1981; Patton, 1978). Carol Weiss, for example, one of the major contributors to research on utilization, has identified five characteristics of information that influence its use in decision making: (a) perceived relevance, (b) perceived research quality, (c) conformity to user's prior expectations, (d) action feasibility, and (e) challenge to the status quo (Weiss & Bucavalus, 1980). These characteristics describe either the content or the context of information and they highlight the

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[1]The term evaluation is used broadly here to include a range of data gathering activities from needs to outcome assessment that inform a variety of program development tasks. The CIPP model as outlined by Stufflebeam (1973) is a reasonable approximation of the variety of information gathering tasks that might be subsumed under the term evaluation. This approach blurs the distinction between planning and evaluation and makes the term "program development" a more appropriate description of the information gathering activities.

importance of clarifying these aspects of the information needs of evaluation users prior to the design of information collection activities.

There are several strategies that one might use to clarify information needs and thereby enhance utilization. The following examples are illustrative:

1) The personal effectiveness and charisma of the evaluator as someone who can elicit and be adaptive to decision maker information needs (Patton, 1978).
2) Approaches to evaluation design that take into account the information use behaviors associated with different decision making models (Shapiro, 1984; Wergin, 1976).
3) Formative approaches to evaluation design which are based on formal and informal conceptions of program theory (McClintock, 1984; Zammuto, 1982).
4) Stakeholder models of evaluation in which the issues and concerns of various program constituents are carefully assessed (Bryk, 1983; Guba & Lincoln, 1981).

Each strategy attempts to improve the fit between the information requirements of program stakeholders and the data provided by the evaluator.

Evaluation Design as Information Management

When conceptualized in the manner described above, evaluation design bears a close resemblance to the broader task of managing information and decision support systems (Keen & Morton, 1978). In addition to the content of information produced by evaluation

studies and other information gathering activities, contextual factors are an important aspect of the information management process (Feldman & March, 1981; Leviton & Hughes, 1981). The contextual aspects of information need would include such phenomena as information source and format, the varied uses for information in different decision tasks, accountability pressures, and the level and nature of program uncertainties.

The literature suggests that managing information to satisfy the content and contextual aspects of information need is a major factor in maintaining organizational effectiveness (Whetten, 1984). Daft and Lengel (1984), for instance, identify two information management tasks that are important adjuncts of effectiveness: giving clarity to equivocal information from the environment (for example, interpreting the need and political support for programs), and ensuring adequate information flows for internal coordination and communication. Others have argued that organizations should be structured so that there is congruence between information production and information demands or needs (Galbraith, 1973; Tushman & Nadler, 1978). Consequently, evaluation design, especially those aspects concerned with utilization of information, becomes an important part of the management of information.

The content and contextual aspects of information need will vary across stakeholder groups, and evaluators need to be concerned with this in the design of studies and dissemination of findings (Cronbach, 1980, chapter 4). This study focuses on the

contextual aspects of administrators' information needs since they are the gate-keepers for information and are typically key collaborators with evaluators in the utilization process. The content of administrators' information needs will always be a function of the particular setting or issue at hand. By focusing on contextual factors, it is possible to identify these aspects of information need that might be generalizable across programs and administrative roles.

Clarifying Administrator Information Needs

Metaphors are important to an understanding of administrative behavior and they have been applied in thought provoking ways to the study of educational organizations. Among the most common and heuristic metaphors are loosely coupled systems (Weick, 1976), organized anarchies (March & Olsen, 1976) and garbage cans (Cohen, March & Olsen, 1972). These descriptors, as well as others grounded in behavioral observation (Boyd & Crowson, 1981; Martin & Willower, 1981), convey an image of the educational administrator as a broker among multiple, autonomous, and often adversarial constituencies inside and outside the organization's boundaries. While administrators may be brokers for many things, including power, goals, resources, structural arrangements and personnel decisions, the common medium of their work is information.

When evaluators are in a staff support role, it is important for them to be able to assess those factors that influence administrators' information needs (Hendricks, 1981). In this way evaluation design can be based in large part on a needs assessment

process that is likely to improve the utilization of findings in policy and program improvement. The literature suggests four contextual issues that require empirical attention: (1) how administrators' preferences for different information sources vary; and the effects on these preferences of (2) different decision or program development tasks, (3) demands for accountability and (4) program uncertainties.

Information sources. Behavioral observation of administrators shows that they exchange and process information across many short episodes of interaction (Mintzberg, 1973). Because of these role demands administrators appear to prefer information that is "live," accessible, and oral (O'Reilly, 1982; Sproull & Zubrow, 1981). Designing evaluations to meet needs for this kind of verbal information might include testimonial procedures such as the adversarial evaluation strategy (Levine, 1974) or the use of hearings (Stenzel, 1982).

On the other hand, there is evidence to suggest that administrators often prefer information in analytic and quantitative form in order to be responsive to external demands for accountability. For example, Feldman and March (1981) argue that administrators operate under normative pressures that require the appearance of accountable and rational decision making. These pressures often lead them to commission large amounts of scientifically credible information in the form of surveys and structured evaluations without much thought about its utility for program improvement.

These two kinds of information sources, verbal and analytic are both useful to administrators, yet it is not clear which is more preferred. The bulk of the evidence suggests that administrative role demands lead to a preference for verbal sources of information.

Hypothesis 1: For purposes of program development, administrators perceive verbal sources of information as more useful than analytic sources of information.

Another major distinction between sources of information is whether they are internal (e.g., number of client contacts) or external (e.g., future sources of funding) to the organization's boundaries. Daft and Lengel (1984) maintain that both sources are significantly related to effectiveness. External information is important when administrators are expected to occupy boundary spanning roles and to monitor environmental threats and opportunities, while internal information is necessary for the administrative tasks of maintaining social cohesion and coordination within the organization.

Hypothesis 2. Administrators perceive external and internal sources of information as being equally useful.

Decision task. Literature on information needs and preferences typically does not distinguish among the different uses for information. Three types of use have been identified in the literature (Leviton & Hughes, 1981): (a) instrumental use which is action oriented and focuses on short term issues of program design and problem solving; (b) conceptual use which has a more indirect educational value and where the effects are broad

and, in Weiss's (1979) terms, more like enlightenment; (c) and symbolic or persuasive use where the focus is primarily political and the objective is to defend or attack programs or policies.

Given varieties of use, how can information needs be more selectively defined in relation to program development or decision tasks? Beyer and Trice (1982) identify two phases in program development decisions which are relevant to the problem of identifying information needs: decisions related to program adoption and program implementation decisions. Each phase implies a different set of information needs. For example, in the adoption phase there is a need for sensing and search behaviors that will yield information about program alternatives and points of view. Argyris and Schon (1977) describe this process as a critical component of organizational learning and suggest that it is necessary to produce information that allows one to question the assumptions that underlie the program's purposes and methods of operation.

In the implementation phase of utilization information needs might be more routine. Evaluation and feedback become important during this phase as a means of monitoring the implementation of choices that have been adopted. This suggests that routinely gathered information is needed for purposes of external accountability or internal control.

A more differentiated approach for linking information needs with decisions is found in the CIPP model of evaluation design (Stufflebeam, 1973). Information needs and the related evaluation

designs are tied to four program development or decision tasks. The following kinds of information can be gathered about each decision task:

(1) Program context - information related to the needs and characteristics of various stakeholders who will consume services or otherwise affect the program.

(2) Program inputs - information pertaining to the necessary resources, constraints, and feasible activities that might be related to program design.

(3) Program processes - information that reflects day-to-day implementation of programs such as activities, use of services, resource expenditure, staff efforts.

(4) Program products - information that assesses outcomes and helps determine a program's worth, modifications or termination.

Program context and product decisions are typically more visible and affected by information from external sources than decisions about program inputs or processes. Analytic information is also most likely to be useful for assessing program context and products since it provides a more defensible basis for decision making in these public domain areas.

Hypothesis 3: Verbal-external and analytic sources will be perceived as more useful for context and product decisions than for input or process decisions.

Hypothesis 4. Verbal-internal sources will be perceived as more useful for input and process decisions than for context or product decisions.

Accountability demands. The demands on administrators to appear accountable and rational lead to a preference for analytic

information sources, regardless of the usefulness of the information for actual decision making (Feldman & March, 1981; Maynard-Moody & McClintock, 1981). McGowan (1976) provides some support for this contention in her review of evaluation designs which she claimed created "rational fantasies" about program operations. The evaluation designs served to reassure policy makers that programs were being managed responsibly, but there was no possibility that they would provide useful information for program improvement. Others have shown that educational administrators see quantitative sources of information about program performance as more useful for those who judge accountability (Sproull & Zubrow, 1981). Accountability pressures are often most critical around issues of assessing program needs and performance since these are the more visible phases of program development.

Hypothesis 5a: As accountability demands increase the perceived usefulness of analytic information sources will increase; and

Hypothesis 5b: this effect will be greater for context and product decisions than for input and process decisions.

Uncertainty. It is often argued that as uncertainty about programs increases the need for information also increases (Tushman & Nadler, 1978). This conclusion needs to be qualified, however, by the source of information. Previous research suggests that the usefulness of analytic information is greater when program conditions are certain than when uncertain (Henderson & Nutt, 1978). The reason for this is that analytic information

is not helpful for understanding programs whose goals and operations are ambiguous or unpredictable. By similar reasoning one would expect verbal information sources to be more useful when program conditions are uncertain.

Hypothesis 6a: As uncertainty increases there will be a decrease in the perceived usefulness of analytic information sources; and

Hypothesis 6b: As uncertainty increases there will be an increase in the perceived usefulness of verbal information sources.

Method

A self-administered questionnaire was mailed to all state and county administrators from selected program areas in a statewide organization for adult and community education.[2] Useable questionnaires were returned by 119 respondents. This number represented an 86 percent response rate based on the number of returned questionnaires divided by the number of eligible respondents in the population.

State and local level respondents were experienced administrators with an average tenure with the agency of 22 and 7 years respectively, and in their present roles for an average of 7.5 and 5 years. This experience among respondents strengthens generalizations to other administrator populations. On the other hand, all data were collected from one organization, and the results should be

[2]Non-administrator respondent groups were also surveyed in the same study but are not included in this analysis. The agency studied was Cornell Cooperative Extension.

generalized with caution to agencies with different missions and structures.

Measurement of the variables for testing hypotheses was conducted in the following manner:

Information sources - Respondents were asked to rate the usefulness of 12 information sources on a 5-point Likert scale (from 1, not at all useful, to 5, very helpful). The information items represented eight verbal sources, such as discussions with agency clients (internal) and government officials (external), and four analytic sources such as structured outcome evaluations. As discussed below, each source was rated for four decision tasks. The conceptual groupings of the resulting 48 items achieved appropriate scaling reliability using Cronbach's Alpha (see Appendix A for reliability estimates for all variables measured).

Decision task - The previously described rating of the usefulness of information sources was done across each of four decision tasks: assessing client needs (context), determining program resources and activities (inputs), managing programs (processes), and assessing program outcomes (products).

Accountability demand - Respondents were asked to rate their level of need for information to meet federal, state and local government reporting requirements on a 5-point Likert scale.

Uncertainty - Respondents were asked to agree or disagree on a 5-point Likert scale with several statements about the uncertainty related to program design and operations.

Results

The means for the three information sources broken down by decision task are shown in Figure 1. F-test results and specific comparisons between means are shown in Table 1. The results on overall usefulness in Table 1 support hypothesis 1, since verbal sources were seen as significantly more useful than analytic sources. Internal sources were rated as more useful for program development than external sources, thus hypothesis 2 is not supported.

The F-test results in Table 1 show that there were significant differences for each information source across the four decision tasks. All but one predicted difference across specific decision tasks were significant; the mean usefulness for verbal internal information sources on product decisions was higher than expected. In general, when administrators were making public decisions such as assessing needs or evaluating program effects, they preferred information from analytic and verbal-external sources. Thus, hypothesis 3 is supported and hypothesis 4 receives support on three of the four predicted comparisons.

The effects of accountability demands on the average usefulness of analytic information sources were significant ($\bar{X}$ for high accountability = 3.6; $\bar{X}$ for low accountability = 3.1; $t = 3.15$, $p<.01$). The usefulness ratings for analytic information sources under high and low accountability and across decision task are shown in Figure 2. All differences are of equal magnitude and are statistically significant ($p<.01$ using t

tests). These results support hypothesis 5a but do not support hypothesis 5b. While the mean usefulness for analytic sources is highest in context and product decisions, the effects of accountability demands are equally great in all decision tasks. The effects of uncertainty on the usefulness of information sources are shown in Table 2. All information sources were perceived as more useful for certain than uncertain program conditions, though this difference only reached significance for analytic sources. This supports hypothesis 6a but not hypothesis 6b.

Discussion

Several major patterns emerge from the analysis. First, it is clear that administrators prefer verbal over analytic information sources when one examines all program development decision tasks together. Even in the product assessment task, where structured program evaluation is most likely to be appropriate, verbal sources of information are perceived to be as useful as analytic sources.

It is worth noting, as predicted, that the means for analytic sources are highest on the context (e.g., needs assessment) and product (e.g., program evaluation) tasks. This finding supports the view that analytic information has symbolic value, since it is seen as more useful in those publicly visible tasks where it signals to others that decision making is being supported with rational scientific methods (Feldman & March, 1981).

At the same time, it is not surprising that administrators see verbal sources of information to be as useful as analytic sources for tasks such as needs assessment and program evaluation. Obviously there are significantly greater costs to acquiring analytic information and cost factors are known to weigh heavily on information acquisition (Arrow, 1974). In fact, viewing the cup as half-full, one might say that it is interesting to note how high the means are for analytic sources.

A second consistent pattern concerns the U-shaped distribution of information source means across decision tasks (except for verbal-internal sources on context decisions). This pattern represents the "black box" image of program management in which decisions about inputs, such as resource allocations, and processes, such as how programs are implemented, are loosely coupled to information use. This is especially the case for the usefulness of analytic information on process decisions as shown in Figure 1. Possibly analytic information sources such as computer-based monitoring systems are not viewed as useful or cost-effective methods for program development decisions. Clearly, evaluators face a major challenge in the design of program monitoring systems that are seen by administrators as useful tools for program management.

The effects of accountability demands were generally as expected except that the increased usefulness of analytic information was similar in size across decision tasks. Despite the lack of support for hypothesis 5b, the results for accountability

highlight the importance of the symbolic uses of information. When administrators are expected to demonstrate accountability they find that analytic information sources are much more useful to them. Again, this finding supports the view that administrators use analytic information as a signal to others that they are managing programs in a rational and responsible manner (Feldman & March, 1981).

The effects of uncertainty on the usefulness of information were not clear. As predicted, analytic information sources were more useful when program conditions were certain; i.e., understood and predictable. Although the differences were not significant, verbal information sources were also seen as more useful under conditions of program certainty -- the opposite of what was predicted. The pattern of results suggests that information from all sources was less useful when program conditions were uncertain, which is contrary to intuition and previous research findings.

One explanation for the mixed uncertainty effects on verbal information may be a construct validity problem. The measures reported in this analysis focused on uncertainty related to program inputs and processes, not program contexts or products. It is possible that a combined measure of uncertainty would strengthen the somewhat low scale reliability reported in Appendix A, and perhaps yield the predicted results. In fact, given the low reliability of the uncertainty scale, the results on usefulness of analytic sources might even be stronger than shown in this analysis.

It is also possible that the effects of uncertainty on information need cannot be validly measured with self-administered questionnaires. The survey reported here was part of a triangulated design in which naturalistic methods were used to address many of the same issues. The comparative findings of these two approaches suggests that naturalistic methods capture those aspects of information need that are more difficult to articulate (Green & McClintock, in press). Given that questions about program uncertainty by definition probe ambiguous issues, it is likely that the questionnaire measures of uncertainty did not validly assess this construct.

Conclusions

Several major conclusions can be drawn from this study. First, it is clear that administrators have highly varied perceptions of the usefulness of different information sources. Most research on information needs assessment has not distinguished the usefulness of different information sources for varied decision tasks. Though it is commonly understood that administrators prefer verbal information, this study has shown that this preference depends on the task at hand. Verbal information may be seen as more useful for instrumental use, such as the day-to-day administrative decisions about allocating program resources and monitoring implementation. But under circumstances of public visibility and accountability pressures, such as judging client need and program effectiveness, administrators appear to find significant conceptual or symbolic use for analytic information.

Designing evaluations and information systems to be responsive to this variability in need and use for information is still at a primitive stage. Promising leads may be found in the methods used for policy oriented assessments of programs (Hendricks, 1981), and graphic portrayals of verbal program descriptions (Trochim, in press). Each of these approaches attempts to provide verbal and analytic information that can be used by decision makers for instrumental, conceptual or symbolic purposes. Still, there are too few exemplars of evaluation design in which information from sources with offsetting biases are triangulated for the purpose of improving program decision making (Greene & McClintock, in press).

A second issue of significance that emerges from this study is the relatively low usefulness ratings for analytic sources on input and process decision tasks. It is obvious that administrators do not see the value of analytic information for tasks such as resource allocation, program design and monitoring. It is not hard to see why since techniques such as cost analysis (Levin, 1983) can be expensive to use and difficult to comprehend in the hectic pace of managerial life. And, while the promise of computer-based decision support systems for program monitoring has been around for some time (Keen & Morton, 1978), its realization in practice has proved difficult to achieve.

The problem is probably not that administrators do not need analytic information for use in program design and monitoring, but that such information is too costly or unwieldly. Future

research on this topic might examine the ways in which analytic and verbal information could be linked more effectively, so that the user could make use of the contrasting strengths of each source. In addition to the methods mentioned earlier, Bayesian statistical procedures offer a promising approach to relating quantitative and qualitative information (Edwards et al., 1975). Though the statistical reasoning of Bayesian methods would be obscure for the average administrator, there are workable techniques for implementing the method that could serve as a useful basis for linking the intuitive verbal with the logical analytic information source.

An important issue that was not addressed in this study has to do with how use of different information sources relates to program effectiveness. The ultimate purpose of improving utilization is to improve program quality. There is virtually no research that seriously addresses this issue, though it is clearly of major significance. Respondents in this study made numerous comments on their questionnaires reflecting an assumption that there was a connection between improved utilization of information in program development decisions and program quality. The nature of this connection needs to be thoroughly explored.

Finally, the emphasis in this study on the contextual aspects of information should not be misinterpreted as downplaying information content. Utilization-based approaches to evaluation design make clear the importance of assessing the content of stakeholder issues and questions (Bryk, 1983; Guba & Lincoln,

1981; Patton, 1978). Complete assessments of evaluation information needs will require attention to the content and meaning of information as well as contextual factors such as source, decision task, accountability demands and program uncertainty. Together, needs assessments of information context and content should provide a sound basis for enhancing the utilization of evaluation results.

Figure 1. Mean Usefulness of Information Source by Decision Task

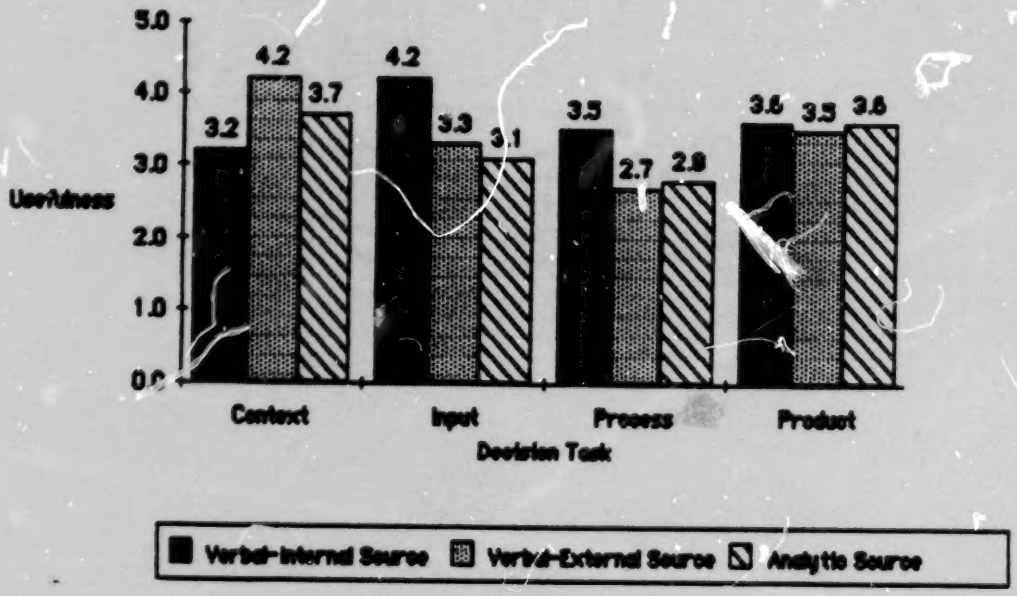

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Table 1. Average Usefulness of Information Sources Across Decision Tasks

	Verbal Internal	Verbal External	Analytic
1. Overall Usefulness*	3.7	3.5	3.3
2. By Decision Task	F=58.9 df (3,105) p<.001	F=96.0 df (3,95) p<.001	F=44.3 df (3,84) p.<001
3. Predicted Comparisons By Decision Task*			
Context vs. Input	3.2-4.2	4.2-3.3	3.7-3.1
Context vs. Process	3.2-3.5	4.2-2.7	3.7-2.8
Product vs. Input	3.6-4.2	3.5-3.3	3.6-3.1
Product vs. Process	3.6-3.5	3.5-2.7	3.6-2.8

* All mean differences are significant at p<.05 using paired t-tests except for verbal internal information in the product vs. process decision comparison.

Figure 2. Mean Usefulness of Analytic Information Source by Decision Task and Accountability

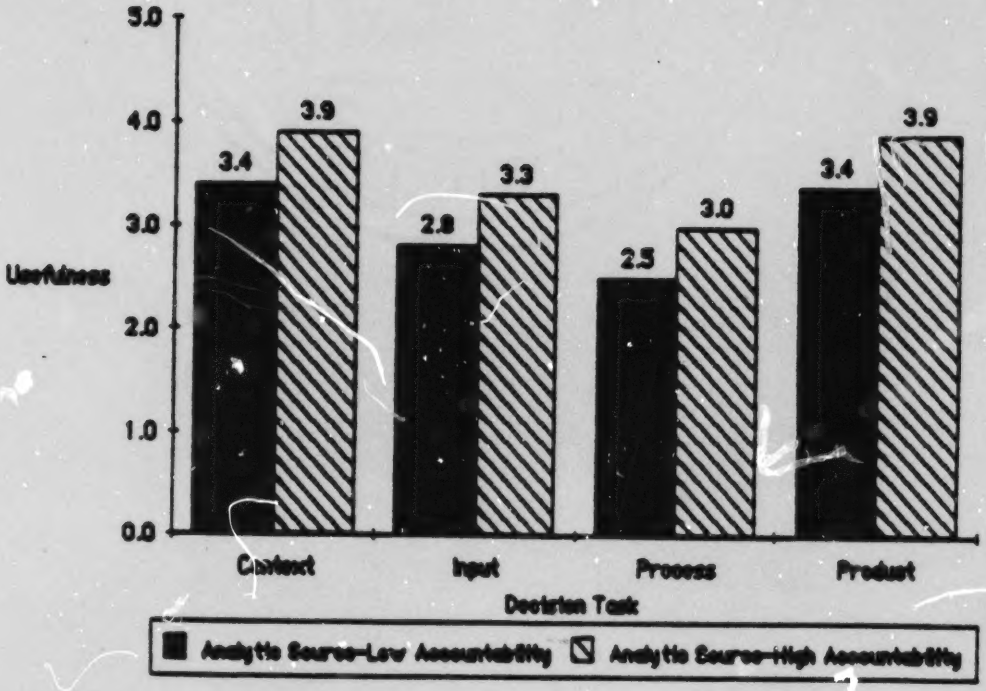

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Table 2. Effects of Program Uncertainty on Mean Usefulness of Information Sources

Information Source	Uncertainty					
	Uncertain		Certain		t	p
	$\bar{X}$	S.D.	$\bar{X}$	S.D.		
Verbal Internal	3.5	.58	3.8	.67	1.88	n.s
Verbal External	3.4	.56	3.5	.64	1.13	n.s
Analytic	3.2	.62	3.5	.79	2.0[illegible]	<.05
n	47		48			

Appendix A

Scale Reliabilities for Information Sources, Decision Tasks, Accountability Demand and Uncertainty

Scale	No. of Items	Alpha
A. Perceived Usefulness of Information Sources		
1. Internal verbal	12	.81
2. External verbal	20	.87
3. Analytic	16	.91
B. Perceived Usefulness of Information Sources By Decision Task		
1. Internal verbal		
a. Context	3	.72
b. Input	3	.53
c. Process	3	.65
d. Product	3	.62
2. External verbal		
a. Context	5	.69
b. Input	5	.75
c. Process	5	.85
d. Product	5	.68
3. Analytic		
a. Context	4	.72
b. Input	4	.74
c. Process	4	.86
d. Process	4	.57
C. Accountability Demand		
1. Perceived need for information for governmental reporting	2	.70
D. Uncertainty		
1. Perceived unpredictability of program design and operations	2	.51

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